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As a matter of fact, the discrepancy lies in the fact that, in addition to this usual behavior, Montgomery records certain atypical cases as follows: five cases in which the members of the double accessory go to opposite poles; ten cases in which the smaller member of the pair divides, one half going with its customary associate to one pole, the other half going alone to the opposite pole; five cases in which the larger member divides; three cases in which both accessories divide. On looking over my material again since the appearance of this and other papers on human spermatogenesis, and also after the examination of some new negro material received in the meantime, I still feel convinced that conditions for the male negro are essentially as I originally described them.

The most decided differences in accounts of human spermatogenesis are those which obtain between the findings of Montgomery and myself on the one hand and von Winiwarter on the other. The latter finds 47 ordinary and one accessory in the male. It must be borne in mind, however, that Montgomery and I worked on the tissues of negroes and von Winiwarter on those of a white man. I am at present engaged in a study of material from two different white men and although not yet ready to make a detailed statement I can say with assurance that the number of chromosomes is considerably in excess of those found in my negro material.

MICHAEL F. GUYER

THE UNIVERSITY OF WISCONSIN,

April 3, 1914

MORAL AND RELIGIOUS TRAINING IN A STATE UNIVERSITY

TO THE EDITOR OF SCIENCE: Chancellor Frank Strong's paper in SCIENCE of November 21, on "Some Educational Problems in Kansas," mentions as one of the great problems confronting education in that state "moral and religious training," saying:

If any were misled years ago into the belief that intellectual training provided sufficient safeguards and moral standards, certainly our experience the last decade must have disillusioned him.

The "if" is a saving word in that state-

ment, to any who might be disposed to disagree with the chancellor, but it still seems a fair question to ask, How otherwise than through the intellect is education of any kind to be conveyed? Also, it would seem to be not altogether out of place to inquire as to exactly what is meant by the terms "moral" and "religious," not to obtrude a discussion of religion in a publication devoted to a quite different purpose, but to make clear the intentions and plans of those, like Dr. Strong, who insist that education is incomplete and dangerous without the application of certain remedies which they have to offer. A few are interested in religion, but all of us in education.

If the meaning of the terms refers to acts of worship, which in their nature are emotional and suggestive rather than instructive, such as prayers, the reading of scriptures and singing of hymns, it is a popular understanding that it is the function of the church to attend to such things, not the high schools, colleges and universities, for in such institutions Jews, Catholics, Greeks, Turks, Chinese, Japanese, Mormons and agnostics often mingle, all with such divergent beliefs touching religion that creedal or sectarian teaching and forms would be wholly out of place. Such students place themselves under instruction to learn the truths of science and history and to study art, literature and languages, not to be proselytized. Like the purchaser of a commodity in trade, they come to buy what they think they need, not what some one else wants to force on them, and if they are forced, in order to get the instruction needed, to take other kinds which are repugnant to their religious convictions, it becomes tyranny.

As to morals, there is no dispute among civilized peoples generally in all parts of the world. Honesty, truthfulness, mercy, forgiveness, unselfishness, restraint of passions, honoring parents—"these and a few others," as Buckle truly said, "have been known for thousands of years, and not one jot or tittle has been added to them by all the sermons, homilies and text-books which moralists and theologians have been able to produce." There could be no objection, of course, to their being taught in the schools if it seemed necessary—

taught directly, not by the subterfuge that they could only follow from religious acts, therefore it is necessary to teach religion—but if made a part of the curriculum I should like to know how large a place our professors would be likely to assign them. Would a three years' course seem too short, or a four year, perhaps, too long to teach a boy that honesty and good habits are right, and the opposite are wrong? Or would such things be assumed to have been taught during childhood in the only proper place—at the mother's knee?

Since Chancellor Strong lays emphasis on the statements, that "after all . . . ours is a Christian civilization," and "Historical Christianity is the basis of our whole life, and we as a nation shall stand or fall with it," he must then mean by the "moral and religious problem confronting education in Kansas as elsewhere" the question of how to bring about the teaching of Christianity by compulsion and at national or state expense, an attempt as out of joint with the times as with the purpose of the founders of the country, that church and state should be forever separate.

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SCIENTIFIC BOOKS

THE EASTMAN-ZITTEL PALEONTOLOGY

THE appearance of a second and very much enlarged edition of Dr. Eastman's English version of Zittel's "Paleontology" (Volume 1, Invertebrates) may be accepted not only as an acknowledgment of the usefulness of the work but also as a response to a growing interest in the study of ancient life. It is very probable that the justification for the revision of this expensive and elaborate work comes chiefly from the American demand, and, if this is true, the demand may perhaps be counted among the first fruits of the efforts made by The Paleontological Society to encourage and widen a deeper concern in that field. While this statement has reasonable worth, yet the fact stands out clearly that the Eastman-Zittel "Paleontology" is by far the best, practically the only satisfactory general guide-book and compendium of the science. Even

the first edition was a more useful book than the German original because of its greater detail and closer analyses, though we have been given to believe the innovations in classification introduced by the first collaborators were not altogether acceptable to the lamented and distinguished author, Professor Zittel. But in a science which covers the whole field of life, progress must be rapid; new encyclopedias soon become old as new lands are explored and old ones more closely scrutinized, and old philosophies and classifications give way under the burden of new knowledge. No one person could to-day successfully do what Zittel did—write a book covering the entire field of ancient life. Versatile as he was in many departments of paleontology, competent to expound as he did the structures of sponges and dinosaurs, to-day such diverse efforts would be looked upon with a grave hesitancy by students generally, that would assuredly weaken the voice of authority.

So, in this new book, there is a divided authority, even more pronounced than in the first edition, and the American author, Dr. Eastman, modestly withholds his own name from any acknowledged responsible share in the separate chapters, which leaves us to infer that he did all the work the others did not do (no small amount when one analyzes the allotments) and of course did the real work on the rationale of all the combined chapters.

In giving to *SCIENCE* a notice of this work, it seems appropriate to restrict it essentially to the new material, either in the form of accretions from later discoveries or of revised classifications, and to present these new features succinctly and with precision the reviewer has asked most of the contributors to briefly state the differences between the old and the new in the chapters with which they have been severally charged.

In the 1899, or first, American edition there were 12 collaborators; in this edition of 14 years later there are 17 coworkers, and but three names of the first list remain on the last: Dr. Dall, Professor Schuchert, Mr. Clarke. The increase in the number speaks of greater refinement of knowledge as well as of wider activity of research in the later years.